Space Weather Forecast

Issued on Saturday, 22 October 2022 at 13:29 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: G1/Minor to G2/Moderate Storm likely, mainly Day 2 (23rd)

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Solar activity over the past 24 hours has been Low, with several, mainly small common class flares observed. There are currently four sunspot regions on the visible Sun, however these are all currently small and simple regions. No Earth-directed CMEs have been observed in available imagery.

Solar Wind / Geomagnetic Activity: The solar wind has been at background levels throughout. The strength of the magnetic field rose erratically from being weak, to become moderate from around 21/2200 UTC. The important north-south component was mainly weak and positive (northward), but became more generally moderately negative (southward) from around 22/0700 UTC. Geomagnetic activity was Quiet with isolated Unsettled intervals, but became Active (Kp4) between 22/0900-1200 UTC.

Energetic Particles / Solar Radiation: The count rate of energetic particles (High energy protons) remained at background with no solar radiation storms observed.

Four-Day Space Weather Forecast Summary

Solar Activity: Solar activity is most likely to continue Low, perhaps falling to Very Low, but with a slight chance of isolated Moderate class flares.

Solar Wind / Geomagnetic Activity: No Earth-directed CMEs currently feature in the forecast period. Solar winds are expected to see a gradual transition into the fast wind of a coronal hole on day 1 and into day 2 (22nd and 23rd), with solar winds most likely to Elevated or a slight chance of becoming Strong. This is low confidence in respect to both timing and strength. The fast winds will likely persist into day 3 (24th), before potentially easing day 4 (25th). Geomagnetic activity is expected to be Unsettled to Active with an increasing chance of G1/Minor to G2/Moderate storms either later day 1 or more likely day 2 (23rd). Quiet to Unsettled with isolated Active intervals are then expected day 3 and day 4 (24th and 25th).

Energetic Particles / Solar Radiation: The count rate of energetic particles (High energy protons) is forecast to persist at background with no solar radiation storms occurring.

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Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	50	90	20	1
Strong	G3	No	1	10	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	No	10	10	10	10
Very Active	R3 to R5 X	No	1	1	1	1

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	1	1	1	1
Very Active	≥ S3 *	No	1	1	1	1

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)

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